The Secretary called the attention of the Meeting to an article by Mr. E. C. Stuart Baker (of Dibrughur), F.Z.S., which had lately appeared in the 'Asian,' February 1900, concerning the Gaur (*Bos gaurus*) and the Gayal (*Bos frontalis*). After a careful study of the subject for several years, Mr. Stuart Baker had come to the conclusion that the Gayal was simply a domestic form of the Gaur, and that the differences between them were produced by domestication. A copy of Mr. Stuart Baker's paper upon this subject had been deposited in the Society's Library.

Mr. G. A. Boulenger exhibited a remarkably large specimen of a Bornean Tortoise, recently described by him under the name of *Liemys inornata*. The specimen, obtained by Mr. C. Hose in Lake Majang, had a carapace length of 64 centimetres. Mr. Boulenger at the same time pointed out that the name proposed by him would have to give way to the prior one of *Brookia baileyi*, which had been proposed by Mr. E. Bartlett, although the description given by that gentleman could not be regarded as a satisfactory one. Dr. Siebenrock, of Vienna, had already shown that the skull described by the late Dr. G. Baur as *Adelochelys crassa* belonged to *Liemys inornata*. The synonymy of *Brookia baileyi* would stand as follows:—

Hardella baileyi, E. Bartlett, Sarawak Gazette, May 1, 1895.

Brookeia baileyi, E. Bartlett, Sarawak Gazette, June 1, 1896, and Note-book Sarawak, No. 2, 1896, p. 81; Bouleng. Zool. Rec. 1897, Rept. p. 26.

Adelochelys crassa, Baur, Anat. Anz. xii. 1896, p. 314, fig.

Liemys inornata, Bouleng. Ann. & Mag. N. H. (6) xix. 1897, p. 469; Siebenrock, Sitzb. Ak. Wien, cvi. 1, 1897, p. 248.

The following papers were read:—

1. On the Anatomy of *Bassaricyon alleni*. By Frank E. Beddard, M.A., F.R.S., Prosector and Vice-Secretary of the Society.

[Received May 1, 1900.]

A specimen of this rare American Carnivore, which was acquired by the Society in 1894[1], having died, I am able to call the attention of the Society to some new facts in its anatomy.

The species to which it belongs, *B. alleni*, was described some years ago by Mr. Thomas[2] and figured. Mr. Thomas commented upon the close likeness which the animal bears to the Kinkajou (*Cercoleptes*), a likeness emphasized by the fact that the individual now under consideration was presented to the Society as a Kinkajou. To Mr. Thomas this singularly close resemblance

[1] P. Z. S. 1895, p. 521.

[2] "On Mammals from Ecuador," P. Z. S. 1880, p. 397, pl. xxxviii.

appeared to be an instance of the phenomenon known as mimicry. It seems to be more likely due to nearness of relationship, combined with a similar mode of life. Besides the external characters, Mr. Thomas described and figured the skull of the animal; I shall return to his descriptions later.

The genus *Bassaricyon* was first made known by Mr. Allen, who figured the skull of *B. gabbi* [1].

This species has been lately re-investigated by M. Huet [2], who figured the external characters as well as the skull; the latter was naturally especially compared with that of the Kinkajou. I am not myself acquainted with the skin of this species; but if M. Huet's figure really represents the appearance of *Bassaricyon gabbi*, then that species is very different indeed from *Bassaricyon alleni*, and not in the least like *Cercoleptes*. The skulls of two individuals are figured, the one being that of a young animal, the other of an older specimen.

In the Proceedings of this Society for 1885, Dr. Mivart summed up what was known about the animal at that date [3]. Dr. Mivart pointed out that "the skull is more like that of *Procyon* and *Nasua* than of *Bassaris*." An important point ascertained by the same author was that "a cast of the inside of the skull shows that the brain possesses an Ursine lozenge." [4] This point alone would serve to refer the animal without any doubt to the Arctoid division of existing Carnivora, a conclusion to which other anatomical facts lead. It will be seen later that I am able to confirm this statement by an examination of the actual brain.

External Characters.

I have made the following measurements of the animal, after preservation in spirit.

Extreme length of body (measured along the curve of the back) from snout to root of tail	17 inches.
Length of tail [5]	$10\frac{1}{2}$ „
Length of fore limb	$6\frac{1}{2}$ „
Length of hind limb	9 „
Length of ear	$1\frac{1}{4}$ „

As to the colour of the fur I have nothing to add to Mr. Thomas's remarks, except to say that the specimen studied by myself was darker. I agree with him that the tail offers no evidence of being prehensile.

[1] Proc. Acad. Nat. Sci. Philadelphia, 1876, p. 21, pl. i.; and Bull. U.S. Geol. Survey, v. p. 169.

[2] "Note sur les Carnassiers du genre *Bassaricyon*," Nouv. Arch. Mus. Paris (2) v. p. 1.

[3] "On the Anatomy &c. of the Arctoidea," P. Z. S. 1885, p. 363.

[4] "Notes on the Cerebral Convolutions of the Carnivora," Journ. Linn. Soc., Zool. xix. p. 13.

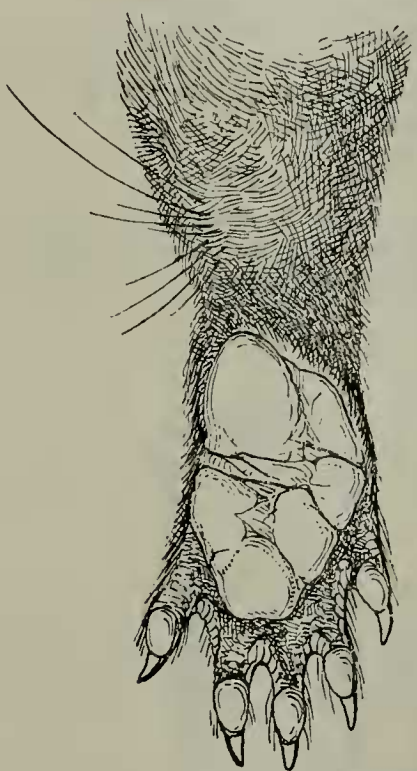
[5] The tail was defective; I consider that about one inch is missing.

The nose is naked, and there is a marked median groove which also cleaves the upper lip. This groove is perfectly visible upon the dorsal surface of the nose, and there are even indications of it on the fur-clad region behind. The nostrils are prolonged into narrow slit-like orifices which are quite visible laterally.

The palms and soles are quite naked. The claws are not of great length or strength. Neither are they of course retractile.

There are five or six long vibrissæ forming the whiskers, three or four upon each cheek and two or three under the chin. Furthermore, on the arm not far from the hand is a tuft of long and quite

Fig. 1.



Manus of *Bassaricyon alleni*, illustrating the tuft of vibrissæ upon the wrist.

similar hairs. They appear to agree with a "cluster of long stiff hairs" described as occupying an identical position upon the arm of *Lemur catta* and of other Lemurs by Mr. Bland Sutton [1]. Apart, however, from the subject of the present paper, these tufts of long hairs upon the arm are by no means peculiar to the Lemurs, as might be inferred from reading Mr. Sutton's paper. I have seen them on a Malabar Squirrel and upon the arms of several other

[1] "On the Arm-glands of the Lemurs," P. Z. S. 1887, p. 369.

kinds of mammals. They may very conceivably be tactile in function.

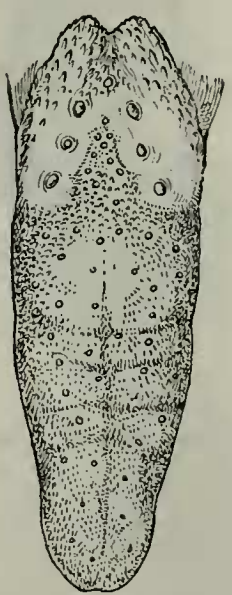
In any case they are connected with a strong nerve which can be readily felt and seen when cut by removal of the skin. The nerve is 1 mm. or so in thickness just where it enters the skin to supply these vibrissæ. The roots of the latter can be seen to project slightly from the under surface of the skin when the latter has been flayed off in the ordinary way. It is suggestive that these nervous structures should be present near to the wrist of mammals which make considerable use of their hands. A nocturnal habit may be also partly explanatory of their presence and obvious importance in some capacity or another; the large size of the nerve and of the vibrissæ themselves seem to justify the statement that they are obviously important.

The example of *Bassaricyon alleni* which I have studied is a female; it has, as had the skin examined by Mr. Thomas, a single pair of mammæ, which are some three inches or so in front of the anus. The same number of mammæ is found in *Cercoleptes*.

Alimentary Viscera.

The *tongue*, as exhibited in the drawing (fig. 2), seems to be very like that of *Cercoleptes*. It has seven circumvallate papillæ arranged in the usual triangular fashion with the apex directed

Fig. 2.



Tongue of *Bassaricyon alleni*, dorsal view.

towards the throat. The back part of the tongue at the fauces has a number of longish backwardly directed horny papillæ. The fungiform papillæ are scattered irregularly all over the dorsum of the

tongue; there is a group of them high up in the Λ formed by the circumvallate papillæ, and at this region there are no filiform papillæ, which commence somewhat lower though still between the limbs of the Λ. The fungiform papillæ extend to the very apex of the tongue.

Mesenteries.—Concerning the mesenteries, I have the following observations to offer, but I am unable at present to compare their arrangement with that obtaining in other Arctoids.

The free edge of the omentum was absolutely free, it having acquired no secondary connections with the rectum or other viscera.

The bottom of the duodenal loop is attached for about half an inch on the ascending limb by a special mesentery to the common dorsal mesentery of the alimentary canal in the region of the commencement of the large intestine. This is as nearly as possible exactly opposite to the insertion of the mesentery which passes from the gastro-splenic omentum and supports one limb of the pancreas.

Stomach.—The stomach is in no way remarkable in form. It is perhaps rather elongated. The œsophageal and pyloric orifices are about an inch apart, and the greater curvature is some $4\frac{1}{2}$ inches. The extreme length of the stomach is $2\frac{1}{2}$ inches. The pyloric portion, as in *Ælurus*[1], *Cercoleptes*, and other forms, is tubular and very thick-walled; it is hard to the touch, and can be thus easily distinguished from the rest of the stomach and from the duodenum. The length of this portion of the stomach is nearly an inch. Its orifice into the rest of the stomach is marked by numerous longitudinal converging folds, and it is traversed by similar folds. Externally it can be seen to commence abruptly. It is to be distinguished from the duodenum by a constriction.

The *spleen* is straight, wider at one end, and measures about 2 inches.

The *intestines* measure about 62 inches.

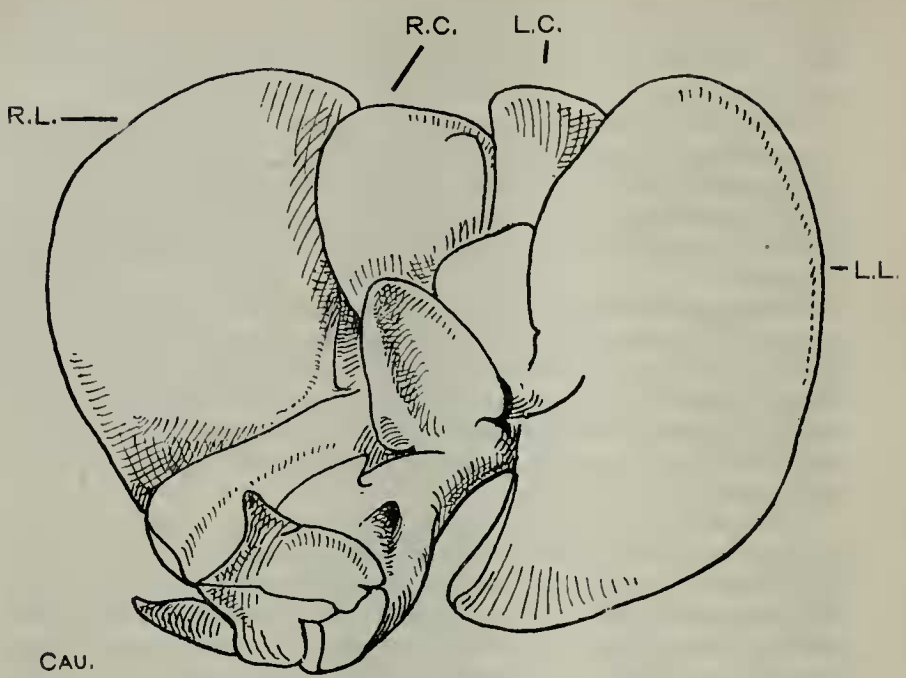
Although there is of course no cæcum, the increase in calibre marks the commencement of the large intestine. Reckoned in this way, the small intestine occupies 55 inches of the length of the entire tract, while the remaining 7 may be called large intestine[2].

The *liver* is displayed in the accompanying drawing (fig. 3, p. 666) from the abdominal surface. The features chiefly worthy of note are in the first place the very large size of the caudate, which consists of two very distinct lobes. The Spigelian lobe is also fairly developed. The gall-bladder is deeply imbedded in the liver, but is not visible upon the diaphragmatic aspect. The right lateral lobe is larger than the left lateral, but the left central lobe is larger than the right central. From the left lateral lobe is detached a small separate lobe.

[1] Flower, "On the Anatomy of *Ælurus fulgens*," P. Z. S. 1870, p. 752.

[2] Or perhaps this should be considered as rectum only.

Fig. 3.



Liver of *Bassaricyon alleni*, abdominal aspect.

CAU., caudate lobe; R.L., right lateral, R.C., right central, L.C., left central, and L.L., left lateral lobes.

Pancreas.—The pancreas of *Bassaricyon* is a thinnish gland, divided as in *Bassariscus* into two limbs which join not far from the emergence of the pylorus from the stomach. They thus together form a **V** of which one limb is distinctly longer than the other. The longer limb runs parallel to the spleen. There is also a small lobe given off from the shorter limb near to its distal extremity; this curves round and joins the apex of the **V**, thus enclosing between itself and the shorter limb an oval tract of mesentery.

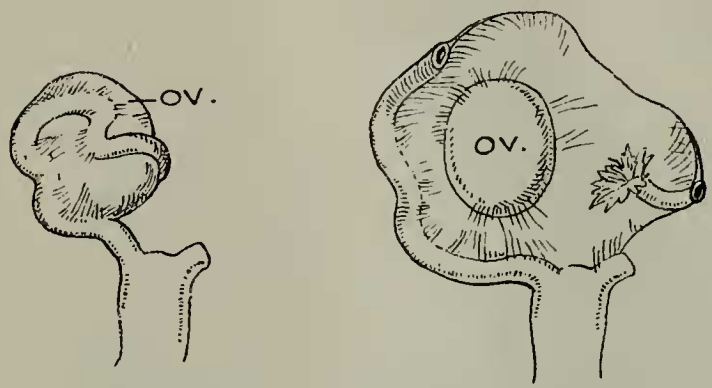
The pancreatic duct enters the small intestine in common with the bile-duct at a point about half an inch away from the pylorus.

The Ovary and the Oviduct.

It has been noticed that in a few mammals—in the Rat for example—the ovary is perfectly continuous with the oviduct owing to the fact that both the ovary and the mouth of the oviduct are enclosed in a completely shut-off pocket of peritoneum. I have found the same state of affairs to characterize not only *Bassaricyon* but also *Cercoleptes*, which is an interesting bond of union between these two Carnivora. There appeared to be absolutely no communication between the ovarian sac and the

surrounding peritoneal cavity. This state of affairs is an exaggeration of what is to be seen in some other mammals. In

Fig. 4.



Ovary (*ov.*) and oviduct of right side of *Cercoleptes*. In the right-hand figure the sac containing the ovary and the mouth of the Fallopian tube is cut open to display these structures.

the Paca for example the ovary can be perfectly easily pushed into a little pocket, and quite concealed from view when the fold bearing the mouth of the oviduct is drawn over it. It is normally half concealed.

The Brain.

The brain of *Bassaricyon* resembles very closely that of *Bassariscus*[1]. The general outline is almost identical. The hemispheres diverge posteriorly to display the cerebellum. The crucial sulcus is situated rather anteriorly, and is well marked, curving round laterally after running forwards for a short way.

In *Bassariscus* a "lozenge" is not formed, there being in the brain of that animal no forward process of the crucial sulcus on either side to enclose a space.

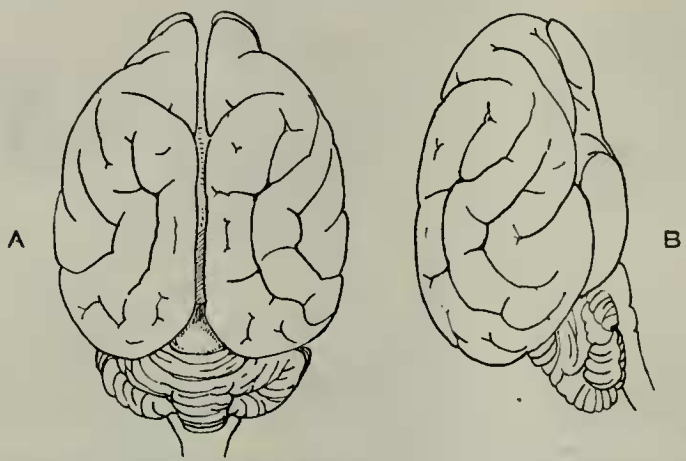
In *Bassaricyon* there are distinct indications of such forward processes, particularly on the right side. But, as will be seen from the drawing exhibited (fig. 5, p. 668), there is nothing like the complete "lozenge" of larger Arctoids. As to this feature in the brain, there is no possibility of confounding *Bassaricyon* with *Cercoleptes*, which latter has a fairly well developed "ursine lozenge"; and in addition the anterior part of the brain lying in front of the crucial sulcus is much more depressed below the level of the rest of the hemispheres than is the case with *Bassaricyon*.

The chief longitudinal fissure of the brain, that which divides the sagittal from the parietal gyrus, does not reach the margin of the pallium posteriorly; it does so however more nearly on the

[1] "On certain points in the Anatomy of the Cunning Bassarisc, *Bassariscus astutus*," P. Z. S. 1898, p. 129.

right side than on the left, thus resembling in a curious way the brain of *Bassariscus*. In both these animals the fissure in question is feebly marked compared with the same fissure in the brain of

Fig. 5.



Brain of *Bassaricyon alleni*. A, dorsal view; B, lateral view.

Cercoleptes. In a brain of the last mentioned animal which I have been able to study, I found a curious likeness to *Bassaricyon* (and *Bassariscus*) in the fact that this fissure did not quite reach the margin of the pallium.

The sagittal gyrus is folded upon itself anteriorly as it is in other Carnivora; but there is no fissure upon the reflected part of the gyrus such as occurs in *Bassariscus*.

The only other matter which seems to call for comment is the presence of a bridging convolution between the parietal and the sagittal gyrus on the left side of the brain. In the brain of *Bassariscus* this occurs on the right side. In the brain of *Cercoleptes* there is no bridging convolution on either side.

The Lungs and Heart.

On the right side there are three lobes of the lung, of which the lowest is the largest and the middle one the smallest. On the left side there are two lobes about equisized. In addition to these there is a small ventral unpaired lobe.

The heart gives off two main branches from the aortic arch—an innominate and a left subclavian.

The Muscular Anatomy.

Comparatively few of the genera of Arctoid Carnivora have been investigated as to their muscular anatomy. What is already known about the subject is summed up by Messrs. Windle and

Parsons in their account of the muscular anatomy of the Carnivora in general [1].

I have therefore thought it desirable to dissect at least the more important muscles of *Bassaricyon*, with a view of testing some of the classificatory conclusions of the two authors just named. This task has been rendered easier by the very useful summary of muscular characters in various families of Carnivora with which Messrs. Windle & Parsons's memoir concludes.

The *Pectoralis* consists, as in the Kinkajou [2], of three distinct portions. The anterior, and at the same time the most superficial part of the muscle, is the smallest division. It is about $\frac{3}{4}$ inch in breadth at its origin from the sternum, and narrows gradually towards the insertion. Beneath this, and extending from the anterior to very nearly the posterior extremity of the sternum, is a large sheet of muscle which forms the rest of the pectoralis. Anteriorly to behind the end of the first third of the sternum, this sheet of muscle is divisible into a superficial and a deeper layer; behind this point there is an oblique tendinous inscription and the two layers are fused. They are inserted perfectly separately on to the humerus. The origin is not only from the sternum but also from the adjacent parts of the ribs.

The *Rhomboideus* is entirely a single muscle: the anterior part which arises from the head cannot be distinguished as a rhomboideus anterior or rhomboideus capitis.

There is no trace that I could discover of any *Rhomboideus profundus* such as occurs in many Arctoids (especially Mustelidæ), and even in the near ally of the present genus, *Cercoleptes*.

The *Serratus magnus* forms one muscle including the levator anguli scapulæ. Its origin extends as far back as the 7th rib. Its attachment to the scapula is almost exactly coextensive with that of the Rhomboid. There is a tendency to a slight differentiation of the posterior muscle in that the insertion is faintly to be distinguished from that of the rest of the muscle.

The *Biceps*, as is the case with the majority of the Carnivora, is a single-headed muscle possessing only the long head. It is curious that in this feature *Bassaricyon* departs from its nearest allies; for in *Cercoleptes* and in some other Arctoids the second head of the biceps is present. In *Bassaricyon* there was an obvious though small fleshy coracobrachialis, but no trace of a second biceps head.

The *Coracobrachialis* has just been referred to. There was only one muscle present. Perrin reports its double character in *Cercoleptes*; but Windle & Parsons found it to be single in that Carnivore.

Latissimus dorsi.—This very large muscle is partly covered by the musculo-cutaneous, which latter is inserted into the humerus near

[1] "The Myology of the Terrestrial Carnivora," Pt. I., P. Z. S. 1897, p. 370; Pt. II., 1898, p. 152.

[2] For the muscular anatomy of that animal see Perrin, P. Z. S. 1871, p. 547.

to it. The chief facts about its origin to be noted are that it does not extend back as far as the ilium, and that part of its origin is from the last three ribs; it joins the teres at insertion which forks over the head of the biceps.

The *Trapezius* presents no particular features of interest; it is attached largely to nearly the whole length of the spine of the scapula; and there is also the cephalo-humeral portion which passes down the arm but is inserted on to the humerus as in other Arctoids.

The *Omotrachelian* is of course present and attached just in front of the last-mentioned muscle.

The *Dorso-epitrochlear* is slender and strap-shaped.

The *Deltoid* calls for no special remark. It is composed of two portions as in other Carnivora (not counting the *cephalo-humeral*).

The *Triceps* consists of four distinct portions which can be referred to this muscle, and possibly of a portion whose nature is somewhat doubtful and with which we shall deal presently.

The two outer heads are thick muscles which blend with each other not very far from their insertion on to the elbow. Their origins are concealed by the two divisions of the deltoid. The posterior of the two arises from the margin of the scapula near to the glenoid cavity. The origin of the anterior is from the head of the humerus. These two divisions are superficial to a deeper stratum of the triceps. This latter consists of the two portions that appear to exist in other Carnivora. Of these one arises just under the anterior superficial head and joins about halfway down the humerus the fourth head, which arises from the upper part of the shaft of that bone.

A broad slip of muscle, which appears to correspond to the second dorso-epitrochlear of some authors, arises superficially from the tendinous junction of the latissimus dorsi and the teres major, and therefore considerably above the origin of the undoubted dorso-epitrochlear. It is a flat strap-shaped muscle, and is inserted much nearer to the elbow-joint than the dorso-epitrochlear.

The *Anconæus* is a fleshy mass arising from the lower half of the humerus, and inserted on the same level as the deep portion of the triceps.

The *Epitrochleo-anconæus* was found.

The *Supinator longus* is present, as in all Arctoids and the majority of the Carnivora.

The *Extensores carpi radiales longior et brevior* are completely blended and indistinguishable at their origin. Concerning the *Extensor carpi ulnaris*, *Extensor communis digitorum*, *Extensor minimi digiti*, I have no remarks to offer.

The *Extensor digitorum profundus* arises from the dorsal surface of the ulna only.

The *Extensor ossi metacarpi pollicis* arises as in other Carnivora from both radius and ulna.

The *Pronator radii teres* appears to have an exceptional arrangement in *Bassaricyon*. As a rule in this group of Arctoids the

muscle appears to be inserted on to the end of the radius. It was inserted accurately into the middle of that bone in *Bassaricyon*.

The *Flexor carpi radialis* did not seem to be inserted on to a metacarpal but on to the radial carpal.

The *Flexor carpi ulnaris* is single-headed and is inserted on to the pisiform.

The *Palmaris longus* is a thin muscle associated with the last and overlapping the flexor sublimis: it spreads out below into a fascia. This muscle I believe to be the palmaris longus externus. The internus I could not discover, so that in this particular *Bassaricyon* departs from its ally *Cercoleptes*, where both muscles are present.

The *Glutæus maximus* has a fleshy insertion on to the middle of the femur for a very considerable part of that bone, after the great trochanter. The anterior part of the muscle is inserted quite separately on to the trochanter, there being a considerable interval between the insertions of the two muscles. It nearly completely hides the underlying *glutæus medius*. This muscle is very thick and fleshy and shows traces of being a compound structure including the pyriformis. At the insertion the distinction of the two is quite obvious.

The *Glutæus minimus* arises and is inserted below the last.

The *Tensor fasciæ* has a flat tendon and a short and flat muscular belly; it is inserted on to the fascia about half-way down the thigh.

The *Sartorius* is comparatively narrow at its origin, but it widens out greatly at its insertion, entirely covering the knee.

The *Gracilis* is formed of two quite distinct parts whose origins occupy together the whole length of the symphysis pubis; they unite before their insertion on to the leg; the posterior half of the muscle is the larger and has a partly tendinous origin.

The *Biceps* is two-headed: one, which is chiefly tendinous, springs from the tuber ischii; the other, which is fleshy, arises in common with the glutæus maximus. The insertion on to the leg is not very extensive, about the upper one-third.

I could not find a *Caudo-femoralis*.

The *Pectineus* is a huge fleshy muscle divided into two layers, and is distinct from the *Adductor*. There is but one adductor, which is strap-shaped and fleshy throughout. It is inserted at the end of the femur and partly on to the tibia. I am not quite certain whether this may not be the presemimembranosus of Messrs. Windle & Parsons.

The *Semitendinosus* has a strong, narrow, round tendon of origin from the tuber ischii and no second head.

The *Semimembranosus* presents no particular features of interest.

The *Tenuissimus* muscle of this animal is very plain on dissection, although extremely slender. It arises beneath the glutæus maximus; it ends in a flat tendon which is closely associated with the semitendinosus but close to the insertion of the latter.

The *Gastrocnemius* is two-headed.

The *Plantaris* is totally absent. This is very unusual, but there is no possible doubt about it.

The *Soleus*, on the other hand, is present. The muscle arises from the head of the fibula, and so it cannot possibly be confounded with the plantaris, which of course has a femoral origin. Moreover its fibres also partly arise from the septum between itself and the peroneal. Its tendon joins that of the gastrocnemius.

Of the *Flexores tibialis* and *fibularis* and the *Tibialis posticus* I have nothing to say save that they were present and quite normal.

The *Tibialis anticus* has a double tendon of insertion, and the muscle itself was double the smaller and lower portion, arising entirely from the fibula, while the larger half arose from both tibia and fibula. The lower half appears to be the equivalent of the *extensor proprius hallucis*, since its tendon is continued to the end of that digit; while the *tibialis anticus* proper is attached to the base of the first metacarpal by its much stouter tendon.

The *Extensor longus digitorum* is not remarkable. It has a long tendon of origin from the femur and a fleshy origin from the head of the fibula.

I found the three *Peroneals* mentioned by Perrin in *Cercoleptes*.

Osteology.

As has already been mentioned, both species of *Bassaricyon* have been described as regards the skull and teeth by the three gentlemen who have dealt with those two species. In order to make the present account of the skeleton more complete, I shall recapitulate the main features in the skull as well as of the other bones, comparing them with the corresponding bones of *Cercoleptes*.

On the palatal aspect of the skull, it is seen that the palate of *Bassaricyon* is wider than that of *Cercoleptes*, and increases in width from before backwards as far as the end of the series of teeth; its form is thus roughly triangular, as compared with an oval form in *Cercoleptes*. This feature appears to be more marked in *B. alleni* than in *B. gabbi*. The length of the zygomatic arch from before backwards where it becomes confluent with the tooth-line is greater than in *Cercoleptes*. The anterior end of the palate at the insertion of the incisors is almost semicircular in outline in *Bassaricyon*, and nearly straight in *Cercoleptes*. In *Bassaricyon* the tympani bullæ extend laterally and posteriorly nearly to the edge of the skull; in *Cercoleptes* there is a considerable flattened area of bone in this situation. The paroccipital processes, which are not long in either genus, thus come to lie close to the tympanic in *Bassaricyon* and some way away in the Kinkajou.

On the lateral aspect of the skull, the chief difference which is apparent is that the zygomatic arch in *Bassaricyon* is arched more strongly upwards than in *Cercoleptes*. The infra-orbital foramen is visible on this view in *Cercoleptes*; it is not in *Bassaricyon*. The last molar lies behind the maxillary part of the zygomatic arch in *Cercoleptes*; this is not the case with *Bassaricyon*.

On the dorsal aspect of the skull, the zygomatic arches are seen to project more at the sides in *Cercoleptes* than in *Bassaricyon*. In the latter, owing to the greater width and different curvature of that part of the zygomatic arch which joins the skull anteriorly, the infra-orbital foramen is visible on this view; it is not in *Cercoleptes*.

The mandible is much slighter, not nearly so deep in proportion to its length, in *Bassaricyon*. The symphysis, moreover, is considerably longer in *Cercoleptes*. The lower border of the mandible is curved convexly downwards in *Bassaricyon*; it is nearly straight and with a slight ventral concavity in *Cercoleptes*. The coronoid process is much longer than the angular process in *Bassaricyon*; the two are about equal in *Cercoleptes*.

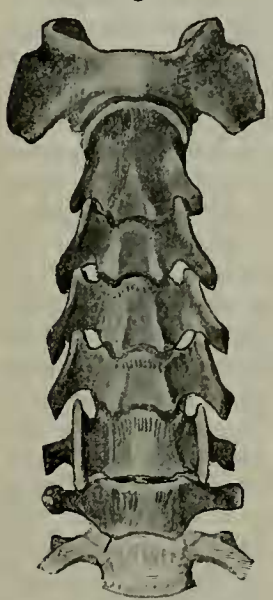
The vertebral column of *Bassaricyon* has the following formula:

C. 7. D. 13. L. 7 ca. S. 3. Ca. 15+

It has thus one dorsal fewer than has *Cercoleptes* and one lumbar more. Its formula is in fact the same as is that of *Bassariscus*.

The atlas and the axis (*cf.* figs. 6 & 7) resemble those of the Kinkajou; the third, fourth, and fifth cervicals show hardly any

Fig. 6.



Cervical vertebræ of *Bassaricyon alleni*, ventral view.

Fig. 7.

Cervical vertebræ of *Cercoleptes caudivolvulus*, ventral view.

distinction between the lower and the upper lamellæ of the transverse processes; this, however, is partly shown on the fifth, and is very marked on the sixth. In *Cercoleptes*, on the other hand, all these vertebræ have markedly bifid transverse processes, while the lower lamella of the sixth vertebra is by no means so

large as in *Bassaricyon*. The third, fourth, and fifth cervicals have in *Bassaricyon* double hypapophyses; these are absent in *Cercoleptes*. In the dorsal vertebræ the spine slopes backwards in the first ten; the change is so marked (as indeed it always is in this group) that the spine of the eleventh is in absolute contact with that of the tenth. *Cercoleptes* is similar in this point of structure.

In the caudal series the first four vertebræ bear V-shaped chevrons which are not ankylosed to the centra. After this the two equivalent processes widely diverge with each other and are firmly ankylosed. In *Cercoleptes* the first five chevrons form complete canals and are detachable from the vertebræ; that of the sixth is composed of two pieces which nearly meet but are ankylosed with the centrum. The rest are divergent and do not enclose a canal; they are also ankylosed. Since the tail of *Cercoleptes* is prehensile while that of *Bassaricyon* is not, it is not surprising to find that the transverse and other processes of the caudal vertebræ are more marked and continue marked to nearer the end of the tail in that form than in *Bassaricyon*.

As already mentioned, there are thirteen pairs of ribs. Of these the first nine are attached to the sternum. The capitula of the first ten are intercentral in position; those of the rest have moved back on to the centrum of their vertebra. A distinct tuberculum is not visible after the tenth. In *Cercoleptes* there are fourteen pairs of ribs; the additional one in that animal differs from those which precede it in the fact that it is attached not to the centrum of its vertebra but to an apparent transverse process which, however, is not ankylosed to the centrum and, moreover, is directed backwards while those of the succeeding lumbar vertebræ are directed forwards. In *Bassaricyon* the transverse processes of this vertebra (which certainly have not ribs, as the skeleton was most carefully preserved) have the same direction as those which follow, though they are rather smaller. The first eleven ribs of *Cercoleptes* have capitula which are intercentral in articulation. This eleventh rib is the last which possesses a distinct tuberculum. Only nine, as in *Bassaricyon*, reach the sternum. In both genera the sternum consists of nine pieces; and in both the last but one is much smaller than those on either side of it.

The shoulder-girdle is very like that of *Cercoleptes*; the outline is precisely so, but the ridges, on the inner surface of which there are four in *Cercoleptes*, are reduced to two. I saw no clavicle, which if present must be very minute, as it is in *Cercoleptes*. As to the remaining parts of the skeleton, I have noted no differences from *Cercoleptes*.

It may be useful to append to the foregoing notes upon the structure of *Bassaricyon* a condensed definition of the genus. It should certainly be referred to the Procyonidæ, as has indeed been the opinion of all recent writers.

Genus Bassaricyon.

External form like that of *Cercoleptes*, but with non-prehensile tail. Nose grooved anteriorly. Mammæ 2. Sole of feet naked. Premolars 4; molars 2; both tri-tuberculate in upper jaw; in lower jaw 2 molars with 4 tubercles. Vertebral formula: C. 7, D. 13, L. 7, S. 3, Ca. 15+? Nine ribs join the sternum. Clavicle entirely absent. In skull, palate much produced behind last molars, coronoid process of mandible long and backwardly hooked, angular process slight.

2. On a new Serow from the Malay Peninsula. By A. L. Butler, F.Z.S., Curator, Selangor State Museum.

[Received June 19, 1900.]

It has hitherto been supposed that the Serow which occurs in the Malay Peninsula is identical with *Nemorhædus sumatrensis* (Shaw). No skin from this region, however, has ever been sent to Europe, and on examining two specimens recently obtained on the Larut Hills, Perak, I am convinced that they belong to a species as yet undescribed.

From the following description it will be seen that the Malayan Serow differs conspicuously from *Nemorhædus sumatrensis* in its jet-black legs, the limbs in that species being always tan or rufous. This uniformity of colouring on body and limbs alone gives the animal an entirely different appearance from the Burmese Serow.

Nor does it agree in any way, as might perhaps have been expected, with Blyth's *N. rubidus* from Arakan. Blyth described the Arakan species (Cat. Mamm. Mus. As. Soc. 1863, p. 174), from a stuffed head, an adult skin and one of a kid, as being "of a red-brown colour with black dorsal list; the hair shorter than of the others." The Malayan animal is mostly black, the undercolour on the back is greyish white; the hair is not shorter than in *N. sumatrensis*.

Description of a female specimen in the Perak Museum, shot by Sir Frank Swettenham on the Larut Hills, Perak, early in 1899:—

Nemorhædus swettenhami, sp. n.

General colour black, the back strongly and the sides slightly grizzled with grey, the bases of the hairs being whitish. Along the lips whitish grey; the posterior portion of the upper lips, a patch on each side of the lower jaw and one on the throat rusty red. Ears black, grizzled with rusty at the base, and lined and edged with greyish-white hairs. Mane black, mixed with whitish hairs on the fore part of the neck and with reddish hairs towards the withers. Insides of the thighs rusty red. Remainder of head, neck, chest, belly, and legs black. Tail black.